Eötvös Loránd University
Faculty of Humanities

THESES OF THE PhD DISSERTATION

BARTHA KRISZTINA

Speech Processing Techniques of Bilingual Primary School Children

Doctoral School of Linguistics
Leader: Prof. Dr. Bárdosi Vilmos CSc

Applied Linguistics Doctoral Program
Leader: Prof. Dr. Gósy Mária DSc

Committee members:
President of Committee:
Dr. Adamikné Jászó Anna DSc
Reviewers:
Dr. Imre Angéla PhD
Dr. Balaskó Mária PhD
Committee members:
Dr. Neuberger Tilda PhD, committee secretary
Dr. Menyhárt Krisztina PhD
Dr. Antalné Szabó Ágnes PhD
Dr. Lengyel Zsolt CSc, supplimentary member

Supervisor:
Prof. Dr. Gósy Mária DSc

Budapest 2015

1. Introduction

The functioning of speech processing procedures has an impact on learning writing, reading comprehension, and effective communication. Such mechanisms are extremely important in a linguistic environment that is—from a macrosocial point of view—characterized by minority-majority coexistence, and in which—from a microsocial point of view—a specific Hungarian-Hungarian as well as Hungarian-Romanian family pattern can take shape, and in which the education policy often generates ambiguous and less efficient school situations in children's learning processes.

The subject of the present research is the study of speech processing procedures of Hungarian-Romanian bilingual children. It is still not possible to provide a single definition of bilingualism, but researchers usually use the degree of knowledge as well as the frequency of usage of the two languages in question as their starting point for any definition (e.g., Diebold 1961, Grosjean 1982, Skutnabb-Kangas 1997, Bartha 1999). Second language acquisition in early childhood requires great mental effort on the part of the child in terms of working memory, attention, and thinking processes, and, at the same time, it helps in forming mother tongue operations, such as speech perception and speech comprehension (Imre 2005).

Speech perception and speech comprehension are basic processes for both mono- and bilingual speakers. These work in close connection with each other. In speech perception we recognize and identify the smallest meaningless units, that are, speech sounds and their connections. Speech perception takes place on three levels: acoustic, phonetic, and phonologic. These basic processes are helped by auxiliary processes: serial perception, speech-sound differentiation, transformational perception, tempo perception, visual perception (Gósy 2005). Speech comprehension means the correct recognition and interpretation of words, word-connections, sentences, as well as the succession of sentences and their contents (Pléh 1998, Gósy 2000).

In case of disruption or default on any level, the whole system might malfunction, which has an effect on the success of learning processes, reading and writing skills, and, in some cases might lead

to deviant behavior, which might latently impede social integration and personal development in adulthood.

The formation of speech perception and speech comprehension processes was the subject of various studies in the case of monolingual children (Gósy 2007, Gósy–Horváth 2006, Horváth 2007, Markó 2007) as well as bilingual children (Vančoné Kremmer 2007, Menyhárt 2002, Bakk-Miklósi 2009). According to the results, a part of speech processing procedures is characterized by deficiencies in the case of both monolingual, typically educated Hungarian children, and bilingual Hungarian-language dominant children. Researches prove that speech processing deficiency is closely connected to learning difficulties and some speech disorders. It is important to know that backwardness because of speech processing problems is a deficiency that can be overcome. Such deficiencies can be eliminated and speech processing disorders can be reduced with appropriate and early training.

2. The structural outline of the dissertation

The dissertation is comprised of nine chapters, including an introduction, a list of references at the end, as well as an appendix.

In the **first** and **second** chapters I delineate the theoretical framework of the subject. In the first chapter I look at bilingualism from psycholinguistic, sociolinguistic, and educational points of views, while in the second chapter I offer a summary of theoretical models of speech processing procedures and the research aspects of these.

The **third** chapter contains the aims and theses of the research.

In the **fourth** chapter I present the materials and the methods of the research, and the test subjects as well. In my experiment I used the full GMP-diagnostic test for schoolchildren created by Mária Gósy (1995/2006). 136 children participated in the test.

The **fifth** chapter analyses the language use of parents and children who took part in the experiment, especially focusing on the ways they speak with each other, that is rising the questions: which parent is more likely to abandon his/her mother-tongue in a mixed family, and, in this linguistic environment, which language is more likely to be abandoned by the parents in general.

The **sixth** chapter is dedicated to data-analysis. This chapter is further divided in four parts: in the first subchapter I provide a

cumulative evaluation of the results obtained through the GMP-test. This aims at providing a comprehensive and general picture of the entire group's speech processing. In the second subchapter I analyze data according to the family-types the children come from, that is, whether they lived in Hungarian-Hungarian, or in Hungarian-Romanian families. In the third subchapter my data analysis viewed the examination of children's results according to the language of study in the classes they attend. Finally, in the last subchapter I analyze both points of views (family-type, language of study)

In the **seventh** chapter I sum up the results of the research and the causes behind the observed phenomena, I draw the conclusions and formulate the answers to the initial questions.

The **eighth** chapter contains the theses of the dissertation.

The **ninth** chapter contains the short abstract of the research.

The appendices contain one representative copy of the filled test sheets of a child belonging to each test group.

3. The aims and the hypotheses of the dissertation

The research was conducted in Nagyvárad/Oradea (Romania) among primary school students. The aim of the research was to get to know and to describe the speech processing procedures of primary school children from a psycholinguistic point of view in a region where no such research has been previously conducted. In my analysis I took into account the age, the language of studying (Hungarian or Romanian classes), the characteristics of family-types (Hungarian-Hungarian families, or mixed, Hungarian-Romanian families).

In my research I would like to answer the following question: in what ways do the family-type and the language of studying (that is, the language used at school) shape the Hungarian speech procedures of children? I assume that the speech processing procedures will differ from standard values. According to my hypotheses, those students who live in Hungarian-Hungarian families will do better than those who live in mixed families and study in Romanian. I also assume that those students will be closer to the standard who live in monolingual families and study in Hungarian classes, and those will be the furthest from the standard who live in mixed families and study in Romanian classes.

According to my fourth hypotheses, the results of speech processing procedures in the various age groups will significantly grow simultaneously with increasing age regardless of family-type and the language of studying.

4. The test subjects, the materials, and the methods of the research

The research was conducted in seven schools, in 44 Hungarian and 54 Romanian classes. 136 primary schoolchildren in Oradea participated in the research. 34 students live in a Hungarian-Hungarian family and study in Hungarian, 34 students live in a Hungarian-Romanian family and study in Hungarian, 34 students live in a Hungarian-Hungarian family and study in Romanian, and 34 students live in a Hungarian-Romanian family and study in Romanian. 51,5% of the students were boys, and 48,5% were girls. The average age was 8 years and 6 months. All children had normal intelligence and normal hearing.

I used the part of GMP-diagnostics (Gósy 1995/2006) which tests the speech perception and speech comprehension of schoolchildren. The test sequence was made based on the Leveltian type of speech production model (Levelt 1989) and is a standard method in analyzing Hungarian children's speech production processes between the ages of 3 and 13. We could ask the question whether the tests developed for monolingual speakers can be used for bilingual speakers as well. The great diversity inherent in bilingualism and the individual variations make it impossible to develop tests designed exclusively for bilingual speakers. However, this may not keep us from analyzing the speech production mechanisms of bilingual children in their first or second language, because these processes have a definitive role in the processes of effective information acquisition and communication.

For assessing speech perception I tested the acoustic and phonetic perceptions on word and sentence levels, as well as the levels of phonetic and phonologic perceptions. In these we expect 100% efficiency from the age of 7; these mean the functions that ensure successful school performance. The auxiliary processes of speech perception (visual perception, serial perception, tempo

perception, speech-sound differentiation, transformational perception) were also analyzed. I similarly tested the children's sentence and text comprehension. In these processes we also expect full efficiency from the age of 7. A separate part in the test referred to the evaluating of short-term verbal and visual memory. During the testing I also examined word-search, handedness, central functioning, and lateralization (Gósy 1995/2006).

The statistic analysis was made with the help of the SPSS 17.0 software package, with one-way ANOVA variant analysis, and I made a Tukey range post hoc test, as well as a correlation calculation.

5. Use of language in the families of the test subjects

What comes to light from looking at the parents' ethnicity, the language used at home, and the children's attitudes towards language usage is that those children who study in Hungarian and live in a monolingual family are predominantly Hungarian language users. They prefer to use Hungarian generally and in family communication. Similar results are to be expected from children studying in Romanian, and living in a monolingual family. In this case, and based on the linguistic attitude as well as on the language spoken at home, we can also consider these children as dominant Hungarian language users, but in their situation Romanian language has a greater influence, since this is the language they use at school. In the case of children living in mixed families, regardless of the language of studying—Hungarian or Romanian—the use of the two languages is much more divided. Such children are characterized by the fact that they communicate with their parents in two different languages, or they use both languages with at least one of the parents. From the question testing linguistic attitude one can see that they are comfortable with using either Hungarian, or Romanian, or both.

6. The results of the dissertation

6.1. Speech processing data of all students

We observed a deficiency in the average results regarding students' speech perception. The children had the best results in phonetic perception with an average result of 88,6%. In the acoustic-phonetic perception, in word identification the average result was 83,9%, in

sentence identification it was 61,5%, in phonological perception it was 59,2%. In the first two processes the good results are probably due to the fact that here they had to operate with simpler mechanisms. There is a significant difference between the results of the 7 and 10 years old students in terms of phonetic and phonologic perceptions, so that there is detectable development due to increasing age. Besides the gradual, but small amount of progress one can see that there is stagnation at the level of speech perception processes around the age of 8-9. One of the reasons behind such stagnation could be that by this age the spontaneous development is not so strong, and, therefore, the conscious, planned development of mechanisms should be of utmost importance. Stagnation ceases by the age of 10, and the development continues.

Results according to age also show that in the case of 7 years old children the perception-threshold curve is the so-called "bottom-up shell," the students acquiring the best results on the acoustic-phonetic level (here is the peak of the curve). In the case of the 8-10 years old students a "mountain-ridge"-type curve appears; here the peak of the curve signifies the results in phonetic perception. Each type of curve points out the deficiency in speech perception. The types of curves that reflect on the group averages follow the natural development, and these can be developed more quickly and efficiently than the disorders, but the success of the development depends on the depth of the curve, that is, how serious the deficiency is (cf. Horváth 2007).

We have found significant relations between the speech perception processes; so that we can argue that the individual functioning of each process is uncertain. Similarly to the typically developing monolingual children, with the increase of age the number of relations lessens (cf. Gósy−Horváth 2006), but there are correlative processes even at the age of 10.

Children had the same mistakes in sentence repeating exercises: a.) lack of answer, b.) partially repeated sentence, c.) word transposition, d.) an incomprehensive sentence, e.) a new, comprehensive sentence which is similar to the original sentence, f.) insertion, transposition or complete abandoning of suffixes. Typical mistakes in word identification were: a.) substitution with a comprehensive word, b.) substitution with a scale of sound that has phonetic similarity with the original word, c.) lack of answer.

In terms of the auxiliary processes the average results show that children lag half a year behind the standard in serial perception. Because serial perception has a central role in the adequate processing of new lexical units, those who live in a bilingual environment have to rely on this process of speech perception very often, especially when facing new words in the two different languages. So it is understandable that the test subjects were very experienced in this matter. In differentiating speech-sounds, the students, compared to the expected flawless performance, made an average error of 5.5, usually in differentiating long and short sounds, and in telling the difference between voiced and unvoiced sounds.

Their sentence comprehension revealed slightly lower results than what is expected for their age, and even lower results in text comprehension. The average performance in sentence comprehension was 89,8%. In text comprehension the average result was 74,1%, and such performance is something one might expect from 6 years old children. The average values that resulted in this research are similar to the results of other researches that investigated monolingual children (cf. Markó 2007). Between 7 and 10 years of age the comprehension processes show a tendency of progress, a significant difference can be detected in text comprehension according to age groups. Around 9 years of age a slight decline can be observed. In sentence comprehension 7 years old children already demonstrate skills of correctly operating with grammatical structures, so lagging one year behind the norm is probably due to individual conditions and to the bilingual environment.

The mistakes made by the children were typical in both speech comprehension tests. The most difficult structure to comprehend in sentence comprehension is to understand the syntactic expression of time relations, and to recognize the structures with the indirect object as well as the negative structures. The typical errors in text comprehension referred to recognizing and correctly operating with chronological orders and sequencing, and deducing information. The reason behind the difficulties in text comprehension might be that understanding longer oral texts is a complex process, therefore, its functioning is considered as something that comes naturally, and its development is not the subject of primary concern. Throughout their studies children face more and more difficult oral and written texts,

and the longer they carry their underdeveloped speech comprehension, the greater their difficulties will be in the learning processes.

Children achieved the standard results in visual perception and tempo perception, and their short-term memory and word association were also adequate.

6.2. Speech processing data according to family-types

Children from both Hungarian-Hungarian and Hungarian-Romanian families achieved the best scores in the phonetic perception test. In both family-types the greatest underperformance occurred in phonological perception. The speech perception of the groups can be described with the "mountain-ridge"-type curve.

According to the family-types the speech perception processes of children reveal significant differences on the acoustic-phonetic level (sentences) as well as on the phonological level. In all three cases those who came from a Hungarian-Hungarian family outperformed the others.

Age differences and development according to age are relevant neither in the case of Hungarian-Hungarian, nor in the case of Hungarian-Romanian family-types in the sentence identification tests of acoustic-phonetic perception, but they are significant in word identification tests in the phonetic and phonological perceptions.

Regarding serial perception the results of the two groups differ significantly. In differentiating speech-sounds the average results of children coming from monolingual families and those coming from mixed families are almost the same. There is no difference according to age in the two groups, but it is safe to claim that the development of those children who live in mixed families is much more balanced. The causes of this balance are probably that the linguistic awareness is more developed and the perceptual basis is more differentiated in the case of those children who live in a mixed linguistic environment. In visual perception and tempo perception (two auxiliary speech perception processes) both groups achieved normal results according to their age-levels.

Sentence comprehension results show that children lag one year behind the normally expected performance, and there are no significant differences between the groups. In text comprehension those who live in Hungarian-Hungarian families lag two years

behind the norm, while those living in Hungarian-Romanian families show a three years deficiency, so these values are significantly different from each other.

In sentence comprehension the results of Hungarian-Hungarian family-type children increase with their increasing age, but there is stagnation around the age of 9. In this test the age groups do not show significant differences. Those who come from mixed families lag one and a half years behind the norm in the sentence comprehension test at the age of 7, but when they become 10 years old they reach the standard. There is a significant difference between the age groups. In text comprehension both groups slightly develop with the increase of age. By the age of 10 they make up for lagging one year behind the norm.

Verbal and visual memories show results that are in full accordance with the standards expected in this age. Similarly, the results in word association also correspond to the results one might expect from primary school children.

Deficiencies in speech perception and speech comprehension processes in the case of those who live in Hungarian-Hungarian families can occur due to individual conditions, but also due to mixed linguistic environment. Better results in this group may appear due to the fact that the Hungarian language is dominant in the language usage of those children who come from monolingual families. They use Hungarian predominantly; therefore, their linguistic experience is more extensive.

6.3. Speech processing data according to the language of studying

Differences are much more significant when one looks at the data according to the language of study, because in this case there are strongly significant differences in all processes of speech perception. Those who study in Hungarian had better results. Phonetic perception is the best in the case of children attending both school-types, while the deficit of phonological perception is higher in the case of children, who study in Hungarian, and the acoustic-phonetic perception is the weakest in the case of children learning in Romanian. In phonological perception students learning in Hungarian lag three years behind the standard, in acoustic-phonetic

perception students studying in Romanian lag five years behind the standard.

The speech perception of the groups can be described with the "mountain-ridge"-type curve. The "mountain-ridge"-type curve signifies a speech perception deficiency. The speech perception processes of the children studying in Romanian are correlated with each other in many cases, but this phenomenon is quite rare in the case of children studying in Hungarian, that is, the speech perception procedures of the latter became more independent. There is no significant difference according to age in the case of those who learn in Hungarian, but in the case of those learning in Romanian age difference is significant especially in phonetic and phonologic perceptions. Children studying in Romanian underperformed their peers studying in Hungarian in all speech perception processes. As the years progress they almost catch up with their peers in phonetic and phonologic perceptions, but due to the huge initial handicap and in spite of age development they will not make up for the backwardness on the acoustic-phonetic and phonological levels. At the age of 10 their skills are similar to those of 4-5 years olds in these processes.

There are no significant differences between the results of the two groups in terms of auxiliary speech perception results. In serial perception the average values almost reach the standard, however, those who study in Romanian lag one year behind the standard. Tempo perception functions adequately in both groups, in visual perception the results of those who study in Romanian are slightly below their expected age standards. In differentiating speech-sounds both groups had mistakes, which signifies, especially in the case of those who study in Hungarian, that the deficit in distinguishing between sounds may have a negative effect on orthography, vocabulary development, and text comprehension. What also gives cause to concern is that this performance does not increase over the years.

In sentence comprehension the results of those studying in Hungarian are better. In text comprehension there is also a significant difference between the results of the two groups. The average results of children studying in Hungarian almost reach their expected age standards values, but those studying in Romanian lag one year behind the standard. In the sentence comprehension test

those who study in Hungarian show no significant development with the increase of age, which can be explained by the fact that they had a good performance at the age of 7 already; there is no significant progress in text comprehension, however, in this case they would need more training, so that they could reach the expected performance by the end of their primary school years. Regarding age groups there is no significant progress in the case of those studying in Romanian as well, which suggests that, besides instinctual linguistic development, there is a great demand for the development of these skills.

In visual and verbal memory the number of the recalled items is similar in the two groups, and meets the expected values. Differences can be found in the use of language through which the recalling took place. Children studying in Romanian used Romanian in the process of recalling in spite of the fact that the instructions and the words were in Hungarian. Similar good results appeared in the word association exercise, and there is no difference between the groups, but children learning in Romanian also enumerated Romanian words.

The better results of the children studying in Hungarian are probably due to the fact that the language used at school makes children more experienced in solving exercises in Hungarian, but the use of language at school alone provides such a linguistic experience and proficiency that help the functioning of speech perception processes. The weak results of those studying in Romanian demonstrate that they prefer to use Romanian in learning and in everyday life, so that they would need more development in Hungarian in order to ensure the successful use of both languages. In the case of children studying in Hungarian the strengthening of the language of their studies should be encouraged. In the case of children studying in Romanian reaching a balanced bilingualism, and, subsequently, developing Hungarian language seem to be a matter of urgency.

6.4. Speech processing data according to family-types and language of studying

During the third type of analysis we divided children in four groups and considered the effects of the family-type and the language of studying equally. The phonetic perception results of

children attending Hungarian classes and living in a Hungarian family meet the expected values, and the results in acoustic-phonetic perception on the level of words almost reach the standard values. In the other two tests (the acoustic-phonetic perception test's sentence identification level and phonological perception) they lag two years behind the standard. In the speech perception processes of children attending Hungarian classes and living in Hungarian-Hungarian families we could not find any significant correlations, but there are correlations in all the other groups. There is no significant difference in terms of progress at the two well functioning speech processing levels, because children do not need to develop much over the years in order to achieve the optimal performance. In the most difficult exercises there is no significant difference according to age, which shows that the development is not sufficient enough. Around the age of 10 they lag one or one and a half years behind the standard.

In the case of children studying in Hungarian and living in Hungarian-Romanian families the best scores were achieved in phonetic perception and the worst were obtained in phonological perception. Their results in all auxiliary processes were below the results of those living in monolingual families, but were above the results of the other two groups (of those children learning in Romanian). We found similar results between the children studying in Romanian and coming from monolingual families in only one process: phonological perception. Among the four groups the third worst results appeared in the case of those children who study in Romanian and come from Hungarian-Hungarian families. They lag four years behind the norm in acoustic-phonetic perception (sentence identification) and two years in word identification, while in phonetic perception they lag one and a half years behind the standard, and in phonological perception four years, again.

The greatest deficiencies appear in the case of those children who go to Romanian schools and their family environment is also bilingual (mixed). They lag two and a half years behind the standard even in the easiest processes (phonetic perception, acoustic-phonetic perception with word association). In the exercises that require more complex processes (such as acoustic-phonetic perception with sentence identification, phonological perception) they do not reach the level of the 4 years old. The difference between the four groups sheds light on the fact that the speech perception results of children

going to Hungarian schools and living in Hungarian families are the closest to the values expected at their age, and children going to Romanian schools and living in bilingual, that is, mixed families have the greatest deficiencies. Regarding speech perception there are strongly significant differences between the various groups in many processes.

Speech perception processes develop with the increasing age in all four groups. Children going to Hungarian schools and living in Hungarian families reach the values closest to the standard by the age of 10. Results showed that the best progress occurs in the phonetic level, especially in the case of children learning in Romanian.

Regarding auxiliary speech perception processes, visual perception in the case of children going to Hungarian schools in both family-types functions according to the standard, but the results of those studying in Romanian remain below the standard regardless of family-type (they lag one year behind the norm). In tempo perception all four groups reached the average values. In serial perception children studying in Hungarian and living in Hungarian families reach the standard when they are 7 years old already, and keep up with the good performance. Children studying in Hungarian and coming from mixed families, as well as children studying in Romanian and coming from Hungarian-Hungarian families lag approximately one year behind the standard. Children living in Hungarian-Romanian families and studying in Romanian lag one and a half years behind the norm. Age differences are not significant. Children living in monolingual families and learning in Hungarian had remarkably bad results in speech and sound differentiation. This was the only process in which they acquired the worst results. Their performance according to age also showed wide divergences. The unbalanced development also appears in the other groups. The best scores were achieved by children studying in Hungarian and living in mixed families. They were followed by children studying in Romanian and living in monolingual families, and, in their turn, they were followed by children studying in Romanian and living in Hungarian-Romanian families.

In sentence- and text comprehension we expect 100% results from the age of 7. Children studying in Hungarian and living in Hungarian-Hungarian families had good results in sentence

comprehension. They almost reached the standard values. Children studying in Hungarian and living in Hungarian-Romanian families lag one year behind the standard. Children learning in Romanian and living in monolingual families lag one and a half years behind the standard. In the sentence comprehension performance of the 7 years old children, students in both groups learning in Hungarian lag one year behind the standard. Similar results were obtained by children learning in Romanian and living in mixed families, while the worst values were produced by children learning in Romanian and living in Hungarian monolingual families. By the age of 10 the results of children learning in Hungarian and living in Hungarian families reach flawless performance, and the other groups are also close to the standard.

The reading comprehension ability is a complex mechanism, and many processes have to work perfectly in order to reach effective results. Children learning in Hungarian and living in Hungarian families lag one and a half years behind the expected standard. Children learning in Hungarian and living in Hungarian-Romanian families lag two years behind the average standard, while children learning in Romanian and living in monolingual families lag two and a half years behind the standard. The results of children learning in Romanian and living in mixed families are the weakest; their performance is around the standard we expect from 5 years old children. We detected significant differences between the four groups both at the level of sentence and text comprehension. Considering the age groups as well, the results of the 7 years old children are very weak. By the age of 10 only children studying in Hungarian and living in Hungarian families will reach the 100% performance. All the other groups will lag two-three years behind the expected standard at the same age.

In verbal and visual memory the average results of all four groups correlate with the 7±2 performance. We observed in each group that at the age of 7 children do not reach the expected standard in recalling memories, but in the other, elder age groups they do. All groups in word association performed above average.

In every tested group there is a need for the analysis of speech processing and for the development of the children, especially in the risk groups. Among children who learn in Hungarian and live in Hungarian monolingual families there could be individual cases that

need development, that is, students who lag behind the standard. At the same time, the analysis of speech processing in education should become the subject of more attention, because these mechanisms have a basic role in the learning process. For children studying in Hungarian and living in mixed families the strengthening of the Hungarian language is necessary, because this is the language they use in the learning process. Native language skills development for Hungarian children learning in Romanian is necessary because the uncertainties in the use of Hungarian affect the learning of the Romanian language, making the learning process unsuccessful and, thus, might lead to failure at school. Hungarian language development for bilingual children studying in Romanian is necessary, because this is the only chance for them to maintain the balanced bilingualism.

7. The conclusions of the dissertation

In the studies of bilingualism researches describing the role of bilingualism in speech processing procedures, even if we know bilingualism affects the functioning of speech processing, are marginalized even nowadays.

According to the first hypothesis of my research, we can observe that all test subjects lag behind the standard in both speech perception and speech comprehension. Thus, my hypothesis was proven, because children did not reach the standard values that are expected from them at the age of 7 in any of the processes. Among the speech perception processes the acoustic-phonetic perception (tested by word-association), the phonetic perception, and the serial perception brought about results that are the closest to the standard. Adequate functioning can be detected in visual perception and tempo perception. In speech comprehension the results in sentence comprehension are the closest to the expected standard. In the more complex processes the results are below the standard, but such deficiencies could be corrected with development.

According to my second hypothesis, there are differences between the groups of the tested children. I consider this hypothesis partially proven. There were significantly different results at some levels of speech comprehension, as well as in text comprehension according to the family-types. In all cases those who live in

Hungarian-Hungarian families had better results. Even in those processes where we could not trace significant differences one tendency was clear: children living in Hungarian monolingual families had better results. According to the language of studying there are significant differences between the groups, and children studying in Hungarian had better results. Here, children learning in Hungarian outperformed their peers in every speech perception and comprehension process. In some cases of the auxiliary speech perception processes the results did not confirm our initial hypotheses, but even in these processes one could observe the same tendency, that is, children learning in Hungarian did better.

According to my third hypothesis the results of children studying in Hungarian and living in Hungarian-Hungarian families would be the closest to the standard values, and the greatest deficiencies will be in the cases of children going to Romanian schools and living in Hungarian-Romanian families. It is safe to claim that this hypothesis is proven, because children learning in Hungarian and coming from Hungarian monolingual families reached the results closest to the standard, their performance shows similarities with the typical development of monolingual children. In most speech processing procedures the results of children learning in Romanian and coming from mixed families were significantly weaker. The results of the other groups are ambivalent, sometimes coming closer to the results of those children learning in Hungarian and living in Hungarian families, other times lagging behind the standard, thus being similar to the results of children studying in Romanian and living in mixed families.

In my fourth hypothesis I assumed that speech processing procedures will develop in every group with the increasing age. The tests proved that my assumption was only partly correct. I found significant development in several processes, especially between the groups of 7 and 10 years old, moreover, one should never loose sight of those tendencies according to which we can consider speech processing procedures as characterized by oscillations in the age groups. Generally we can argue that there are periods of development around the ages of 7 and 8, as well as 9 and 10, but there are periods of stagnation or regression around the ages of 8-9.

The aim of my research was to get to know the speech processing performance of various groups of primary school children

living in Hungarian-Romanian bilingual environment. Results show that at several levels of the speech perception and speech comprehension processes children lag behind the expected standard, and this situation often causes effects latently, therefore, parents and teachers might recognize them when it is too late.

Test results also show that our educational system is not prepared to deal with children coming from bilingual families; therefore, there would be an urgent need for the construction of such an educational policy, as well as for the extensive use of such curriculum that can support the language acquisition of the majority by children living in a minority without causing the loss of mother tongue.

There has been no research conducted of the speech producing procedures of bilingual children in Romania. We know especially little about those children who come from mixed families or about those whose mother tongue is Hungarian but who study in Romanian. This research reveals the fact that both of these groups are at high risk. The first group is at risk, because in a Hungarian school they are considered as monolingual children, but in order to ensure effective learning processes one should take into consideration their linguistic environment, and their speech processing mechanisms should be developed, so that they would not lag behind their monolingual peers, the dominant Hungarian language users. The second group is at risk, because here Hungarian monolingual children go to a Romanian school where they are considered to be Romanian monolingual students, so they become uncertain of their skills in their mother tongue, and thus, their native language skills cannot become the basis for developing Romanian language skills. These children will have deficiencies in both languages.

The present research describes from a psycholinguistic point of view the speech perception and speech comprehension processes of Hungarian children being at different stages of bilingualism. The fact that one language is used at home and another one at school have no negative effect on the skills of monolingual children studying at a Hungarian school. Moreover, this answers the questions regarding the changes that occur in speech processing mechanisms in the native language if a child who comes from a monolingual family begins his/her studies in the language of the environment, and also

sheds light on the various levels of speech processing skills of those children who live in mixed families and the ways the language of studying (either Romanian or Hungarian) affects these skills.

From an educational and pedagogical point of view the research draws the attention of teachers to the fact that in written language acquisition the speech processing procedures have a primary importance. Results show that children belonging to the different groups have different needs, and their skills should be developed accordingly.

Bibliography:

Bakk-Miklósi Kinga 2009. *Kétnyelvűvé válásunk útjain*. Ábel, Kolozsvár.

Bartha Csilla 1999. *A kétnyelvűség alapkérdései*. Nemzeti Tankönyvkiadó, Budapest.

Gósy Mária 1995/2006. *GMP-diagnosztika. A beszédészlelés és a beszédmegértés folyamatának vizsgálata, fejlesztési javaslatok*. Nikol Kkt., Budapest.

Gósy Mária 2000. *A hallástól a tanulásig*. Nikol Kkt, Budapest.

Gósy Mária 2005. *Pszicholingvisztika*. Osiris, Budapest.

Gósy Mária 2007a. Hibás artikulációs mozgások beszédpercepciós vetülete (6−7 éveseknél). In Gósy Mária (szerk.): *Beszédészlelési és beszédmegértési zavarok az anyanyelv-elsajátításban.* Nikol, Budapest. 125−137.

Gósy Mária – Horváth Viktória 2006. A beszédészlelés és a beszédmegértés összefüggései kisgyermekkorban. *Magyar Nyelvőr* 2006/4. 470−481.

Grosjean, Françios 1982. *Life with Two Languages. An Introduction to Bilingualism*. Cambridge, Harvard University Press.

Horváth Viktória 2007a. Megkésett beszéfejlődésű óvodások beszédfeldolgozási folyamatairól. In Gósy Mária (szerk.): *Beszédészlelési és beszédmegértési zavarok az anyanyelv-elsajátításban.* Nikol, Budapest. 149−163.

Imre Angéla 2005. Kétnyelvű gyermekek beszédpercepciós teljesítménye. *Beszédkutatás 2005.* 123–133.

Levelt, Willem J. M. 1989. *Speaking. From intention to articulation.* A. Bradford Book, Cambridge, Massachusetts.

Markó Alexandra 2007. A mondat- és szövegértés jellemzői és összefüggése 6−9 éves korban. In Gósy Mária (szerk.): *Beszédészlelési és beszédmegértési zavarok az anyanyelv-elsajátításban.* Nikol, Budapest. 285−301.

Menyhárt Krisztina 2002. *A beszédprodukció és a beszédpercepció sajátosságai magyar–bolgár kétnyelvű gyermekeknél.* PhD-értekezés, Budapest.

Pléh Csaba 1998. *A mondat megértés a magyar nyelvben*. Pszicholingvisztikai kísérletek és modellek. Osiris, Budapest. 13–39.

Skutnabb-Kangas, Tove 1997. *Nyelv, oktatás és a kisebbségek.* Teleki László Alapítvány, Budapest.

Vančoné Kremmer Ildikó 2007. *A beszédészlelés és a szövegértés problémái magyar-szlovák kétnyelvű gyermekeknél.* Konstantin Filozófus Egyetem, Nyitra.

Publications related to the theme:

BARTHA KRISZTINA: A beszédfeldolgozási folyamatok működése családtípus szerint kisiskolásoknál. In Váradi Tamás (ed.): *ALKNYELVDOK8, Doktoranduszok tanulmányai az alkalmazott nyelvészet köréből,* MTA Nyelvtudományi Intézet, Budapest, 2014. ISBN 978-963-9074-61-3.

http://www.nytud.hu/alknyelvdok14/proceedings14/

BARTHA KRISZTINA: A beszédészlelés és részfolyamatainak jellemzői kétnyelvű alsó tagozatos tanulóknál. In Jenei Teréz (ed.): *Hagyomány és modernség a XXI. századi tanítóképzésben.* Nyíregyházi Főiskola, Nyíregyháza, 2014. ISBN 978-615-5097-89-8.

BARTHA KRISZTINA: Mondat- és szövegértési vizsgálatok kétnyelvű környezetben. In MAGYARI SÁRA–BARTHA KRISZTINA (eds.): *A nyelv közösségi perspektívája.* EME-Partium Kiadó, Nagyvárad, 2014. ISBN 978-606-739-002-5.

BARTHA KRISZTINA: A beszédfeldolgozás jellemzői magyar domináns kétnyelvű gyermekeknél. In *Beszédkutatás 2013* MTA Nyelvtudományi Intézet, Kempelen Farkas Beszédkutató Laboratórium, Budapest, 2013. ISSN 1218-8727.